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The Fishery for *Pandalus montagui* in the Hudson Strait/Ungava Bay Area, 1979 - 1995

by

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Abstract

The occurrence of Pandalus montagui in the shrimp catches from Division 0B in 1995 required a review of the fishery for this species in the Hudson Strait - Ungava Bay area. Historically, the fishery occurred within shrimp fishing area (SFA)3, primarily west of Resolution Island. In 1995, large catches were taken in Division 0B (SFA 2), east of the island, where the TAC applied only to P. borealis. The data indicated that the resource fished in 1995 was the same as previously fished within the SFA 3 boundary and that a change would be required to the Management Plan in 1996 to insure control over the level of harvest. This can be accomplished by setting a TAC for P. montagui in SFA's 2, 3 and 4, west of 63° W. There was no basis to advise a change in the TAC of 1200 tons previously set for this species in SFA 3.

Résumé

Étant donné l'occurrence de *Pandalus montagui* dans les prises de crevette dans la division 0B en 1995, il était nécessaire d'examiner les pêches de cette espèce dans la zone du détroit d'Hudson et de la baie d'Ungava. Historiquement, la pêche était pratiquée dans la zone de pêche de la crevette (ZPC) 3, principalement à l'ouest de l'île Resolution. En 1995, des prises importantes ont été faites dans la division 0B (ZPC 2), à l'est de l'île, où le TAC s'appliquait uniquement à *P. borealis*. Selon les données recueillies, la ressource pêchée en 1995 était la même que celle qui était exploitée dans les limites de la ZPC 3; de plus, compte tenu de cette information, il faudrait modifier le plan de gestion de 1996 afin d'assurer le contrôle du niveau de capture. À cette fin, il faut établir un TAC pour *P. montagui* dans les ZPC 2, 3 et 4, à l'ouest du 63° de longitude O. Il n'y a pas lieu de conseiller une modification du TAC de 1 200 tonnes auparavant établi pour cette espèce dans la ZPC 3.

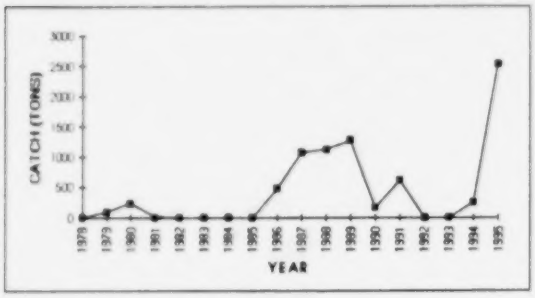
INTRODUCTION

The occurrence of the striped pink shrimp, *Pandalus montagui*, in the eastern Hudson Strait - Ungava Bay area has been known for many years but commercial fishing for this species did not begin until 1980, after a successful experimental-exploratory survey in 1979. Precautionary TAC's of 100 - 200 tons, annually, were advised for the 1978 - 1982 period and were later increased to 850 tons from 1983 to 1986, inclusive, based on estimates of trawlable biomass obtained from a survey in 1982. TAC's were increased to 1200 tons in 1987, following extremely high catch rates (> 5 tons per hr) obtained by one vessel in 1986, and have remained at that level since then. These catch levels were set specifically for *P. montagui* in Hudson Strait - Ungava Bay, west of 64° 30' W, grounds which became known as shrimp fishing area (SFA) 3.

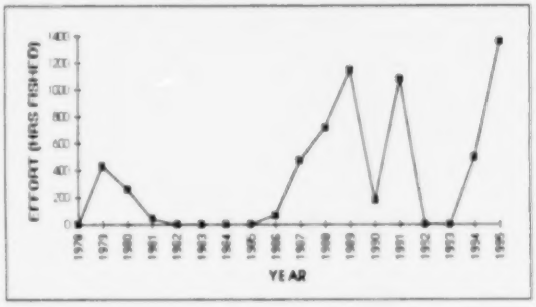
FISHERY DATA

Catch and effort

The fishery in this area largely depends on the existence of favourable markets for the species, the maintenance of high catch rates and the relative performance of the fishery for *Pandalus borealis* in other areas. These, coupled with past concerns for the environmental sensitivity of the area, have resulted in a sporadic fishery since the late 1970's. After an initial increase in catch from 92 tons in 1979 to 236 tons in 1980, fishing virtually ceased until 1986 when 476 tons were taken. From 1987 to 1989, catches remained near the TAC level of 1200 tons but subsequently declined, remaining low or non-existent up to 1994. The catch for 1995 is thought to have increased to at least 2500 tons but the final estimate has not yet been determined (see below).



The historical effort in this area has comprised a combination of exploratory, experimental, directed (from one to several vessels) and opportunistic fishing. Therefore, it is difficult to interpret or calculate a reliable, standardized unit of effort. Unstandardized effort shows the same trend as catch.



Fishing activity to 1994, as reported in vessel logs (Fig. 1), occurred primarily in a limited area, southwest of Resolution Island. A small area in Ungava Bay, west of Port Burwell, also was fished in some years.

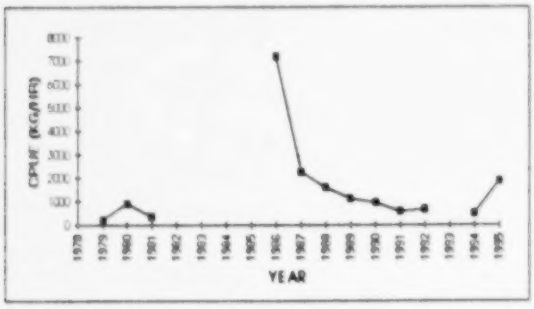
In 1995, fishing was concentrated southeast of Resolution Island, outside the eastern boundary (64° 30' W) of SFA 3. In fact, this

activity resulted from the exploratory fishery for *P. borealis* in SFA 2 rather than from the directed fishery for *P. montagui* in SFA 3. Catches contained both species, in varying proportions, and the *P. borealis* component was counted against the TAC for that species in SFA 2. However, the *P. montagui* catches were not restricted, as there was no TAC for this species in SFA 2. As vessels moved closer to Resolution Island, the catches were almost entirely *P. montagui* and it became obvious that this new-found resource was either a relocation or an extension of the Hudson Strait stock, previously fished well within the SFA 3 boundary.

Fishing for *P. montagui* in the SFA 2/3 area was finally closed at midnight, October 20, 1995, facilitated by restricting vessels to areas east of 62° W where, previously, by-catches of this species in the *P. borealis* fishery were known to be low.

Catch per unit effort (CPUE)

As stated above, this fishery has been noted for extremely high and, often, highly variable catch rates. Unstandardized, annual CPUE's showed a steady decline from 1987 to 1991, following the high 1986 value, and an increase from 1994 to 1995 with the shift in effort to Div. 0B.



Historical fishery data for *P. montagui* in the Hudson Strait - Ungava Bay area (including Div. 0B west of 63° W in 1995) are provided in the following table.

Fishery data for P. montagui in Hudson Strait/Ungava Bay.

YEAR	TAC [1] (t)	CATCH [2] (t)	CPUE (KG/HR)	EFFORT [3] (HR)
1978	100			
1979	100	92	213	432
1980	200	236	912	259
1981	200	13	331	39
1982	200			
1983	850			
1984	850			
1985	850			
1986	850	476	7156	67
1987	1200	1069	2250	475
1988	1200	1125	1572	716
1989	1200	1269	1109	1144
1990	1200	184	924	177
1991	1190	605	560	1080
1992	1190	3	656	5
1993	1190			
1994	1200	244	487	501
1995	1200	2531	1867	1357

[1] TAC's from 1987 to 1990, inclusive, for fishing season May 1 to Apr. 30.
[2] Catch (tons) as reported in logbooks for 1979, economic assessment of northern shrimp fishery from 1980 to 1989 and from year-end quota reports and/or logbooks thereafter.
[3] Effort calculated from catch/CPUE. CPUE calculated from logbook data.

Size composition

Shrimp sampled from the commercial catches in most years (Fig. 2) showed three modes in the length frequency distributions at approximately 16, 20 and 23 mm carapace length. Separation by sex in the 1990's revealed that the smaller two size groups were male and the largest, female. Components within the length distributions reflect the age composition but the details of age and growth have not been resolved for this species.

The data for 1994 and 1995 are noteworthy in that they show clear differences in structure compared to previous years. In 1994, the length at which the ratio of males to females equals 1 is 20 mm compared to 22 mm in

1990, the modal length of females is reduced to 22 mm and the modal length of the largest male component is 18.5 mm compared to about 20 mm in earlier years. The 1995 data show the same tendencies, despite a lack of separation of size groups within the male component. It is possible that sex inversion occurred at a younger age (ages) in recent years. Also, the similarity in size ranges of males and females between these two years, despite the difference in area fished, suggests that they are from the same population.

RESOURCE STATUS/PERSPECTIVES

Scientific advice of the late 1980's noted that the location of shrimp concentrations in Hudson Strait - Ungava Bay changed from year to year and that information suggested a highly variable resource for which the concept of sustainable yield might not be appropriate. An experimental fishery by one or two vessels was advocated, rather than a TAC, but this advice was not followed.

The status of *Pandalus montagui* in the Resolution Island area, with respect to distribution, abundance and dynamics of the resource, remains uncertain, especially given the anomalous distribution southeast of the island in 1995. (No dense concentrations of the species have been observed previously in this area by vessels fishing for *P. borealis* in SFA 2). It is clear, however, that there needs to be a change to the Management Plan for 1996 which reflects the latest information. One way to insure some protection for the resource in 1996 is to apply the TAC for *P. montagui*, not only to SFA 3, but also to SFA's 2 and 4, west of 63^0 W. By-catches of *P. montagui* east of this line in SFA 2, historically, have been low and, although some were encountered in northern SFA 4, especially in 1995, they were well-removed from the concentrations near Resolution Island. This change will require that observers closely monitor the species mix in these areas, ensuring each species is counted against the appropriate TAC.

Regarding the TAC for *P. montagui*, there is no basis to advise a change in the present level of 1200 tons.

Fig.1. Distribution of fishing effort in Hudson Strait/Ungava Bay (SFA 3), 1979-95.

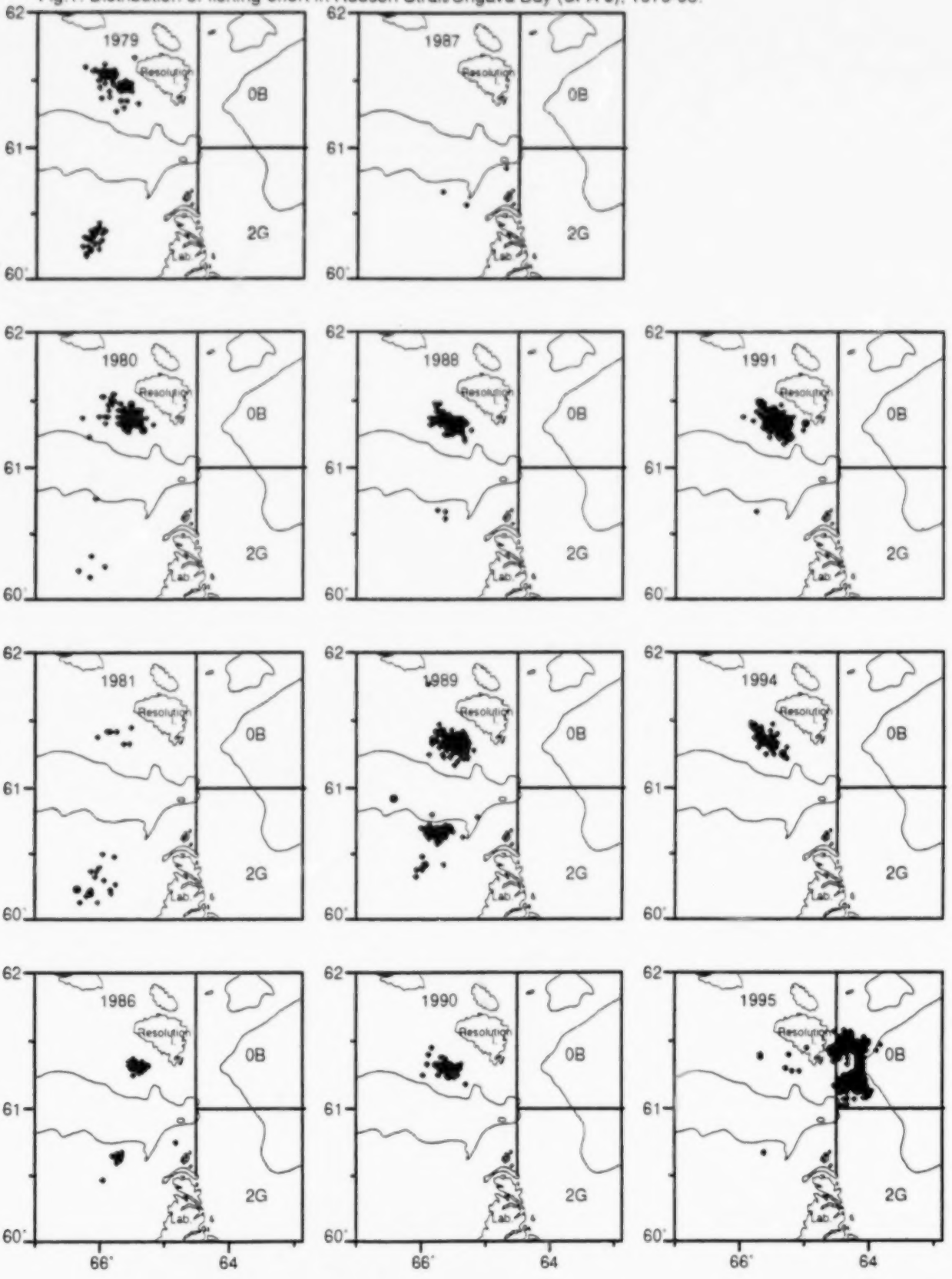


Fig. 2. Catch (numbers-per-hour..000's) in Hudson Strait/Ungava Bay (SFA 3), 1979-1995. Single line graphs represent unsexed samples, broken line=females.